

REMARKS***Grounds of Rejection***

Claims 1, 4-8, 10-12, 14, 16, 18 and 19 are rejected under USC 102(b) as being anticipated by Willard, Jr. (US 5,427,166).

Claims 1-14 and 16-20 are rejected under 35 U.S.C. 1 03(a) as being unpatentable over the Admitted Prior Art (Figure 1 and Pages 9 and 10) in view of Willard, Jr. and optionally in view of Nakasaki (US 4,121,641) and Sato (JP 02154026).

Claim 15 is rejected under 35 U.S.C. 1 03(a) as being unpatentable over the APA, Willard, Jr., Nakasaki, and Sato as applied in claim 1 above and further in view of Arakawa (US 6,286,576),

Claims 9 and 17 are rejected under 35 U.S.C. 1 03(a) as being unpatentable over Willard, Jr. and further in view of Schmidt (US 3,902,356).

Traversing the Rejection

The invention is directed to pneumatic tire bead area construction for improved chafer cracking resistance during run-flat operation.

Figures 1 and 2A show a prior art tire construction having a sidewall 132, a rim flange protector 134, a chafer 136 comprising an abrasion-and-tear resistant elastomer. The prior art tire also includes a rubber-impregnated toeguard 116 wrapped around the bead 102 such that the fabric of the toeguard 116 is close to or at the surface of the tire 100 at a toe portion 140 of the bead area. The fabric toeguard 116 extends radially outward on both sides of the bead 102, but is not positioned near the surface of the tire 100 in the chafer 136, rather the toeguard 116 is typically layered underneath the special elastomer of the chafer 136.

Figure 2B shows the bead area 294 of an EMT tire 100' that is similar to the tire 100, but has a chipper 218 that has been added as reinforcement and as a stiffener for the bead area 294. The chipper 218 is located axially inward of the ply turnup end 105 of ply 104 and extends from just above the bead 102 radially outward between the second ply 106 and the ply turnup end 105. The chipper 218 comprises two layers of crossed cords having cord angles and other dimensions and characteristics which have been shown to improve resistance to chafer cracking in EMT applications less demanding than those addressed by the present invention.

Figure 2C shows the bead area 296 of an inventive EMT tire 101 that is an improvement of the tire 100, due to the addition of an inventive chafer reinforcement fabric component 250 that wraps around the bead 102. Most importantly, the chafer reinforcement fabric component 250 is positioned at the surface 135 of the chafer 136 wherever the chafer can contact the wheel rim flange 122. Therefore, the radially and axially outermost end 253 of the chafer reinforcement fabric component 250 is extended on the chafer surface 135 of the rim flange protector 134 to at least the axially outermost extent of the rim flange 122, limited, of course, to the axially outermost extent of the rim flange protector 134.

The chafer reinforcement fabric component 250 allows a simplification in construction of the bead area 298 of inventive tire 101. Since the chafer reinforcement fabric component 250 provides (and improves) the chafing resistance that is provided by the prior art chafer component 136, there is no longer a need for constructing the chafer 136 with a special chafer compound formulation of elastomer. Thus, in the bead area 298 of inventive tire 101' as shown in **Figure 2D**, the chafer 136' is constructed with a standard elastomer, such as, for example, the elastomer used in the sidewall 132. The result is that the sidewall 132, the rim flange protector 134, and the chafer 136' are of a single, unitary construction of a single elastomer compound.

Willard, Jr. shows a tire construction having a rim seat ply 27 which is analogous to the chafer reinforcement fabric component 250 of the present invention. The reinforced rim seat ply 27 contacts the rim at the tire/rim interface 76. The rim seat ply 27 has essentially square woven fabric reinforcing members at ± 45 degrees with the radial plane and extends circumferentially around the tire. Square woven fabric standard in the industry can be used. The rim seat ply reinforcing members are preferably of a textile material (i.e. aromatic polyamide, polyester, rayon or nylon).

As can be seen in **Figure 2C**, in the present invention, since there is no toeguard 116, the chafer 136 can extend (wrap) around the bead, extending radially outward on both sides (axially outward and axially inward) of the bead 102. This is exemplary of the unitary construction discussed above. Willard Jr. does not teach this.

Independent claim 1 is amended to include the limitation that the chafer extends around the bead. Independent claim 11 is similarly amended.

It is noted that (for example) claim 14 (and claim 5) recites that the chafer reinforcement fabric component extends radially inward of and around the bead and that claim 12 recites that the chafer reinforcement fabric component extends along the entire outer surface of the chafer.

Independent **claim 19** is amended to include limitations similar to those in claims 12 and 14.

Willard, Jr. does not specifically set forth the angles which are recited in dependent **claims 6 and 16**.

Willard, Jr. teaches woven fabric. In the present invention, the cords can cross each other at angles in the range of 70-110 degrees without being woven together. (page 12, line 18). See newly-presented **claim 21**.

Willard, Jr. specifies +/- 45 degrees. An important aspect of the present invention is that the reinforcing cords 342 are at a non-zero angle α relative to the circumferential direction C_D , which is perpendicular to the radius R , and the reinforcing cords 342' are at a non-zero angle α' relative to the circumferential direction C_D . (page 12, lines 26-29). See **claims 7 [15], 16, 19**.

Willard, Jr. is the main reference, and has been discussed at length above. None of APA, Nakasaki, Sato, Arakawa, or Schmidt add anything significant to the discussion.

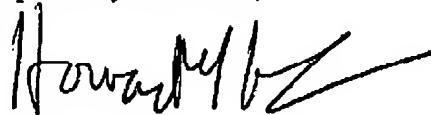
Conclusion

The claims should be allowed.

No new matter is entered by this Amendment.

Applicant has made a diligent effort to amend the claims of this application to overcome the Examiner's objections. If there are still some issues to be resolved, the Examiner is invited to contact the undersigned.

Respectfully submitted,



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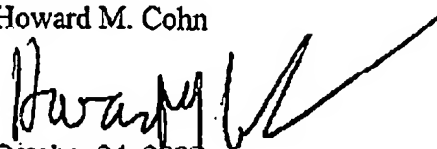
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